

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (currently amended): A computer readable medium including a program having instructions, which when executed perform a method for radix-2 fast fourier transform on a digital series to produce signals in cyclically noncontinuous output bins, comprising the steps of the instructions comprising:

determining the number 2^S of FFT points, the output bin index O_s , and the input signal array;

determining the butterfly index for the last stage by

$$\Psi_{S-1} = O_s \% \left(\frac{N}{2} \right)$$

determining the butterfly index for each stage other than said last stage by

$$\psi_{\ell-1} = \psi_{\ell} \% \left(\frac{N}{2^{S-\ell+1}} \right)$$

where ℓ varies from 1 to (S-1);

using said butterfly index, calculating only those butterflies necessary for calculation of the output bins.

2. (currently amended): ~~A method~~The computer readable medium according to claim 1, wherein said ~~step of determining the butterfly index for all later stages is performed in numerical order.~~

3. (currently amended): ~~A method~~The computer readable medium according to claim 2, wherein said numerical order is ascending order.

4. (currently amended): ~~A method~~The computer readable medium according to claim 1, further including the determination of output bins, ~~wherein by the additional steps of:~~

for stage ℓ , where ℓ varies from 1 to S, executing only that butterfly in the butterfly index set $\Psi_{\ell-1}$ of that stage;

for stage ℓ , loading the twiddle factor corresponding to the butterfly index set $\Psi_{\ell-1}$ of that stage; and

~~repeating the steps of~~ (a) executing only that butterfly in the butterfly index set $\Psi_{\ell-1}$ of that stage and (b) loading the twiddle factor corresponding to the butterfly index set $\Psi_{\ell-1}$ of that stage, until the required final stage butterflies are executed and the required output bins are filled.

5. (currently amended): ~~A method~~The computer readable medium according to claim 1, wherein ~~said step of using said butterfly index includes the further steps of~~further comprises:

setting the butterfly index set Ψ_j where $(1 \leq j \leq S-1)$ and the selected output node index set ranges from O_s to M_s^i by

(a) for $(1 \leq j \leq S-1)$

(i) if $(k \in \Psi_j)$ or Ψ_j contains index k, then setting $m_j^k = 1$;

(ii) if $(k \notin \Psi_j)$, then setting $m_j^k = 0$;

(b) for $j = S$

(i) if $(k \in O_s)$, or O_s contains index k, then setting $m_j^k = 1$;

(ii) if $(k \notin O_s)$, or O_s , then setting $m_j^k = 1$; and

~~Controlling~~controlling of a memory pair stage j by m_j^i ($0 \leq i \leq 2^{j-1}-1$) and m_j^{i+Y} , ($Y = 2^j$ 1).

6. (currently amended): ~~A method~~The computer readable medium according to claim 4, wherein ~~said step of setting the butterfly index includes the steps, when~~ $0 \leq i \leq (2^{j-1}-1)$, ~~of:~~

controlling the butterfly adder with m_j^i

controlling the butterfly subtractor with m_j^{i+Y} ; and

controlling the butterfly multiplier in accordance with the Boolean OR of m_j^i and m_j^{i+Y} .